Systems Thinking in Communities:

Understanding the Causes of Inactivity, Poor Diet/Nutrition, and Childhood Obesity in Hamilton County, Ohio

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Acknowledgments

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Introduction

WeTHRIVE! is one of 49 WeTHRIVE! s participating in the national *Healthy Kids, Healthy Communities* program of the Robert Wood Johnson Foundation (www.healthykidshealthycommunities.org). The purpose of this *WeTHRIVE!* project was to introduce systems thinking at the community level by identifying the essential parts of the Hamilton County, Ohio system and how the system influences policy and environmental changes to promote healthy eating and active living as well as to prevent childhood obesity. To accomplish this goal, community partners and residents participated in a group model building session and discussions. The group model building exercises were designed by staff from Transtria LLC and the Social System Design Lab at Washington University in St. Louis, Missouri as part of the *Evaluation of Healthy Kids, Healthy Communities* funded by the Robert Wood Johnson Foundation. These exercises actively involved a wide range of participants in modeling complex systems and provided a way for different representatives (e.g., residents, government agencies, community-based organizations, businesses, youth organizations, universities) to better understand the systems (i.e., dynamics and structures) in the community (see the *Healthy Kids, Healthy Communities Group Model Building Facilitation Handbook*, www.transtria.com/hkhc). Overall, the evaluation was designed to assess policy, system, and environmental changes as a result of the WeTHRIVE! s' efforts to increase healthy eating and active living in order to reduce childhood obesity.

Hamilton County, Ohio: Background and Local Participation

Hamilton County is located in the southwest corner of Ohio and is mainly comprised of urban communities; only 7% of the population lives in rural areas. Hamilton County is home to 48 distinct political jurisdictions, including the City of Cincinnati. In 2009, the partnership team directed SAH funding to three communities in Hamilton County: Village of Lincoln Heights, Village of Lockland, and Village of Woodlawn. After CPPW funding was received, twelve additional communities were added from within the city of Cincinnati. The communities were: Village of Addyston, Amberley Village, Avondale Neighborhood, City of Cheviot, Cleves, College Hill Neighborhood, Madisonville Neighborhood, City of North College Hill, Northside Neighborhood, City of Norwood, Roselawn Neighborhood, and City of Wyoming. In total, WeTHRIVE! partnered with 15 communities across Hamilton County to develop WeTHRIVE! teams to implement policy, practice, and environmental changes.

Established in 1919, Hamilton County Public Health (HCPH) served more than 460,000 residents within 44 political jurisdictions living outside the cities of Cincinnati, Springdale, Sharonville, and Norwood. Employing over 80 staff members in several different disciplines (e.g., environmental health, disease prevention, health promotion), HCPH "strives to prevent disease and injury, promote wellness, and protect people from environmental hazards." HCPH was made up of the Department of Community Health Services and the Department of Environmental Health Services, which both consisted of several divisions.

Hamilton County Public Health had a history of partnership with organizations providing leadership around healthy eating and physical activity initiatives. This series of partners served as the WeTHRIVE! Leadership Team driving implementation of key strategies. The WeTHRIVE! Leadership Team was comprised of several organizations that worked across Hamilton County to develop and implement policies and systems changes around healthy eating, physical activity, and tobacco prevention. Members of the leadership team included: Cincinnati Children's Hospital Medical Center, The Center for Closing the Health Gap, The Nutrition Council of Greater Cincinnati, YMCA of Greater Cincinnati, and the University of Cincinnati. Each of these partners received significant grant support to scale and spread their work.

WeTHRIVE! was an umbrella brand for driving change that would make the healthy choice an easier choice for all. Individuals, organizations, schools, faith-based institutions, physician groups, and businesses engaged to advance efforts to increase access to healthy foods and physical activity, and decrease tobacco use and exposure. The momentum from these community and organizational teams spurred the development and implementation of policies, systems, and environmental changes that transformed Hamilton County over the past four years into a healthier place to live, work, play, learn, and worship.

The partnership and capacity building strategies of *WeTHRIVE!* included:

- **Cincinnati Regional Food Policy Council:** led by the Nutrition Council of Greater Cincinnati, formed to address local food systems and access through policy, practice, and environmental change strategies.
- **Cincinnati Food Access Taskforce:** led by the Center for Closing the Health Gap and the Cincinnati City Council, and re-activated to build on policy recommendations for expanding access to healthy, fresh fruits and vegetables in high risk neighborhoods that recently lost their grocery stores.
- **Ambassador Program:** piloted to foster collaboration among key individuals to implement shared goals and create healthy communities by using a community-based approach. WeTHRIVE! helped Ambassadors set a goal for their community, develop an action plan, and implement strategies to achieve the goal.

The healthy eating and active living strategies of *WeTHRIVE!* included:

- **Child Care Center Wellness Resolutions:** This initiative focused on enhancing the nutrition and physical activity environment in child care settings by encouraging increased access to healthier foods and beverages, limited screen time, and increased active play.
- **Safe Routes to School:** WeTHRIVE! representatives worked closely with Hamilton County school districts to implement events and programs, develop relationships with the Ohio Department of Transportation, and assist with grant applications to secure funds to develop travel plans and make infrastructure changes.
- **Shared Use:** In partnership with the YMCA of Greater Cincinnati, WeTHRIVE! designed a planning and engagement approach to secure shared use agreements with communities and churches willing to open their spaces to increase physical activity in Hamilton County.

For more information on the partnership, please refer to the Hamilton County case report (www.transtria.com/hkhc).

Systems Thinking in Communities: Hamilton County, Ohio

"Systems thinking" represents a range of methods, tools, and approaches for observing the behaviors of a system (e.g., family, community, organization) and how these behaviors change over time; changes may occur in the past, present, or future. Figure 1 illustrates a system of policies, environments, local collaborations, and social determinants in Hamilton County, Ohio that influence healthy eating, active living, and, ultimately, childhood obesity. This system and the dynamics within the system are complicated with many different elements interacting.

Models, such as Figure 1, provide a way to visualize all the elements of the system and their interactions, with a focus on causal relationships as opposed to associations. Through the model, specific types of causal relationships, or feedback loops, underlying the behavior of the dynamic system, can be identified to provide insights into what is working or not working in the system to support the intended outcomes (in this case, increases in healthy eating and active living, and decreases in childhood overweight and obesity). In system dynamics, the goal is to identify and understand the system feedback loops, or the cause-effect relationships that form a circuit where the effects "feed back" to influence the causes.

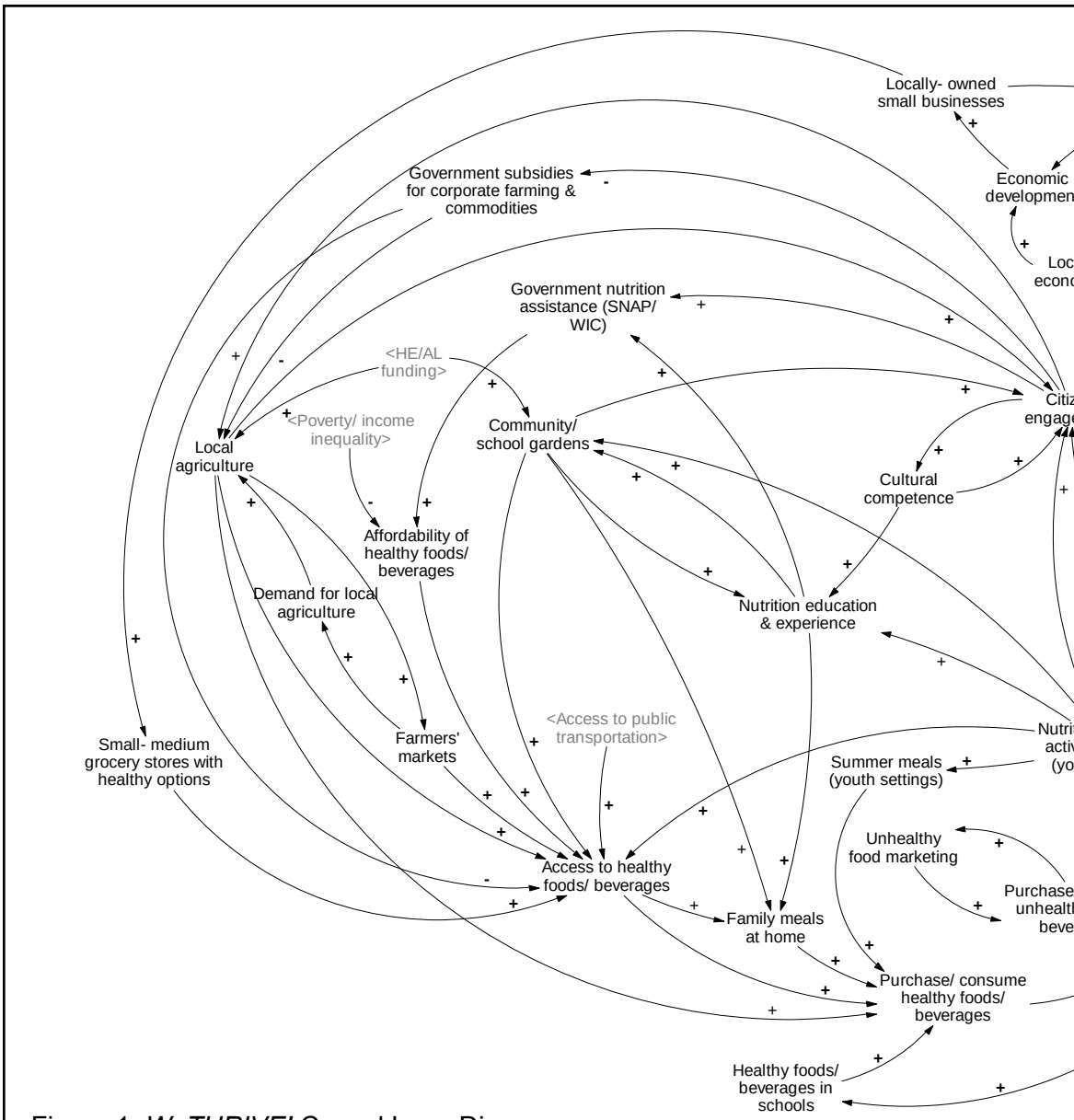
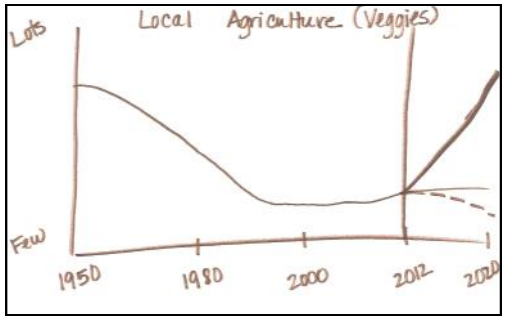


Figure 1: *WeTHRIVE!* Causal Loop Diagram

Group Model Building

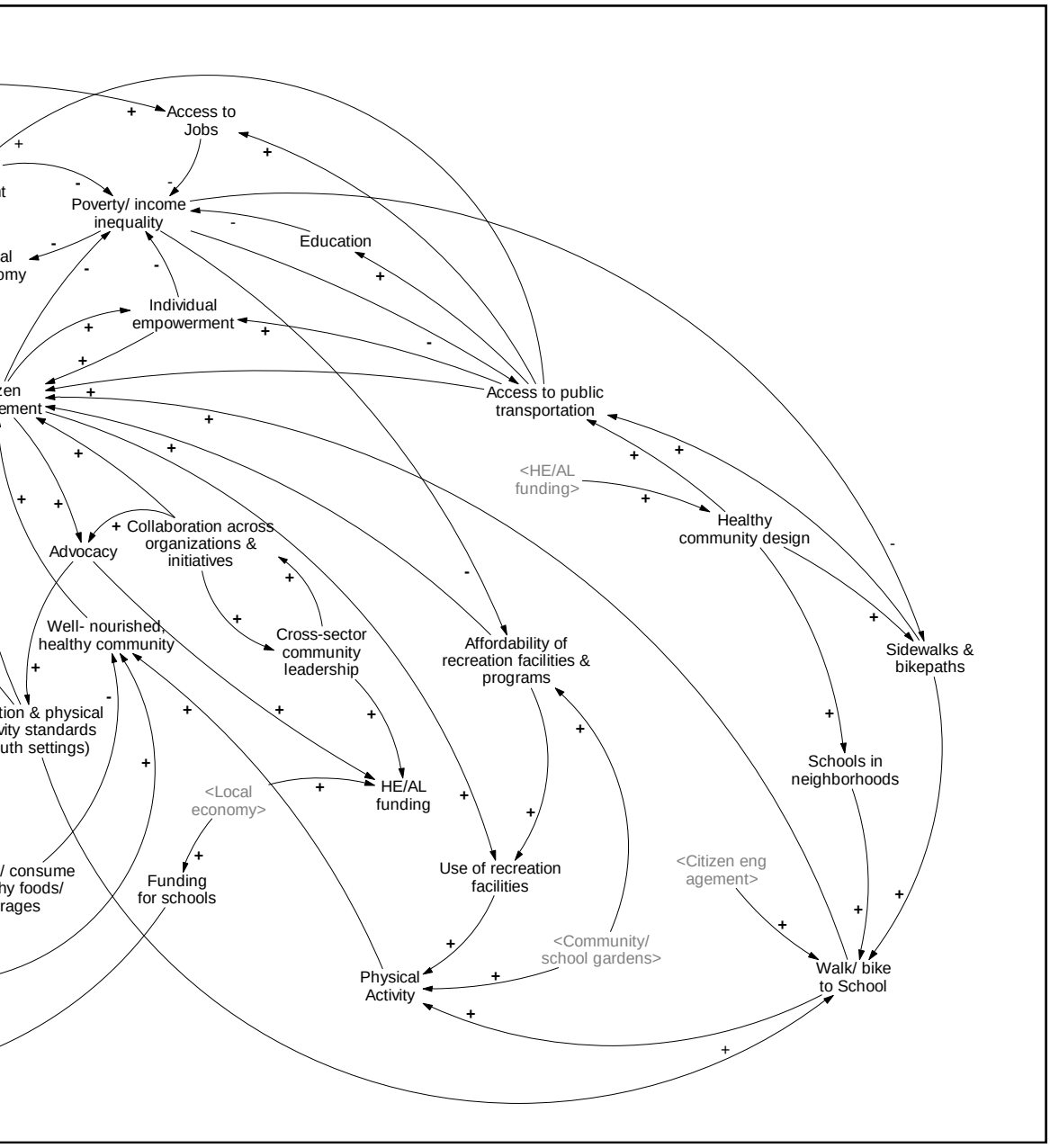
Members of the *WeTHRIVE!* partnership participated in a group model building session in June, 2012 and generated this system, also referred to as a causal loop diagram (Figure 1). Participants in the group model building session included community partners. The group model building session had two primary activities: 1) a Behavior Over Time Graph exercise; and 2) a Causal Loop Diagram (or structural elicitation) exercise.



Behavior Over Time Graphs

To identify the range of things that affect or are affected by policy, system, and environmental changes in Hamilton County, Ohio related to healthy eating, active living, and childhood obesity, participants designed graphs to name the influences and to illustrate how the influences have changed over time (past, present, and future). In this illustration for local agriculture, the amount of local agriculture has decreased from 1950 and leveled off in the

1990's, with the hope that it will increase dramatically in the near future. Each graph is a tool to increase the use of common, specific language to describe *what* is changing in the community as well as *when*, *where*, and *how* it is changing. The graphs capture participants' perceptions of the influence, or variable, and through the graph, the participant tells their story. These perceptions are based on actual data or evidence, or they are part of the participants' lived experience.



Causal Loop Diagram

To examine the relationships among the variables from the behavior over time graphs, participants worked together and with facilitators to develop a causal loop diagram. In Figure 1, the words represent variables of quantities that can increase and decrease over time (i.e., the behavior over time graphs). These variables are influenced by other variables as indicated by the lines with arrows. The lines with arrows represent causal relationships - this is what is known about the system and how it behaves.

One feedback loop is: poverty/income inequality → local economy → economic development → poverty/income inequality.

What is important to notice is that there are other feedback loops interacting simultaneously to influence or to be influenced by poverty/income inequality. Some variables may increase poverty/income inequality while other variables limit it. Determining the feedback loop or loops that dominate the system's behavior at any given time is a more challenging problem to figure out, and ultimately, requires the use of computer simulations.

Based on this preliminary work by the *WeTHRIVE!* partnership, this "storybook" ties together the behavior over time graphs, the participants' stories and dialogue, and feedback loops from the causal loop diagram to understand the behavior of the system affecting health in Hamilton County, Ohio and to stimulate greater conversation related to Hamilton County, Ohio's theory of change, including places to intervene in the system and opportunities to reinforce what is working. Each section builds on the previous sections by introducing concepts and notation from systems science.

Causal Loop Diagram for the Childhood Obesity System

The causal loop diagram (CLD) represents a holistic system and several subsystems interacting in Hamilton County, Ohio. In order to digest the depth and complexity of the diagram, it is helpful to examine the CLD in terms of the subsystems of influence. Because of this project's focus on healthy eating, active living, and childhood obesity, this system draws attention to a number of corresponding subsystems, including: healthy eating policies and environments (red), active living policies and environments (blue), health and health behaviors (orange), partnership and community capacity (purple), and social determinants (green).

From the group model building exercises, several variables and causal relationships illustrated in Figure 2 were identified within and across subsystems. This section describes the subsystems in the CLD.

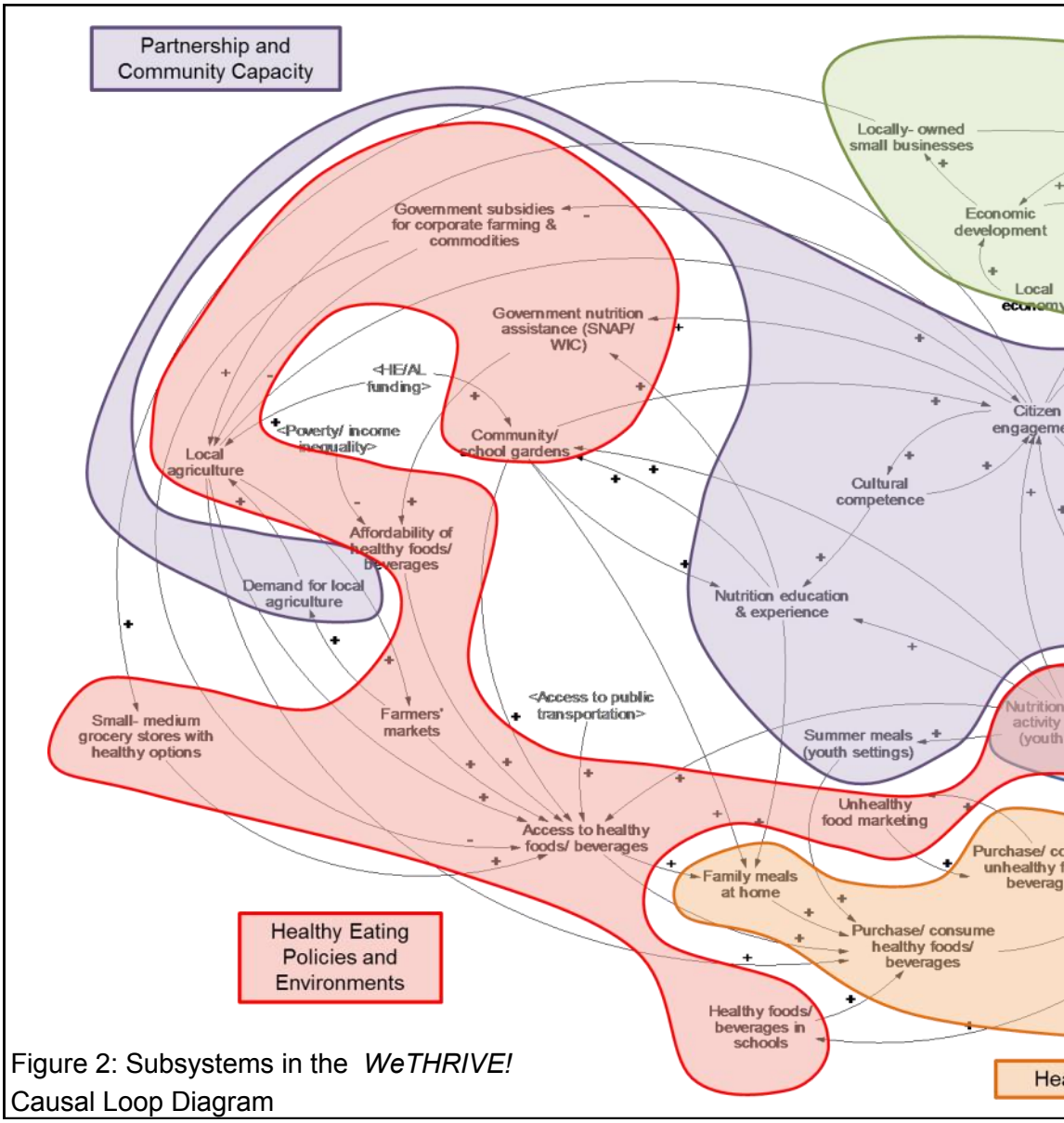


Figure 2: Subsystems in the *WeTHRIVE!* Causal Loop Diagram

Healthy Eating Policies and Environments (Red)

The healthy eating policy and environmental subsystem includes food production, food distribution and procurement, and food retail. During the behavior over time graphs exercise, the participants generated graphs related to policy or environmental strategies (e.g., community/school gardens) or contexts (e.g., government nutrition assistance) that affected or were affected by the work of Hamilton County, Ohio. The variables represent participants' conversations from the behavior over time graph and causal loop diagram exercises.

Active Living Policies and Environments (Blue)

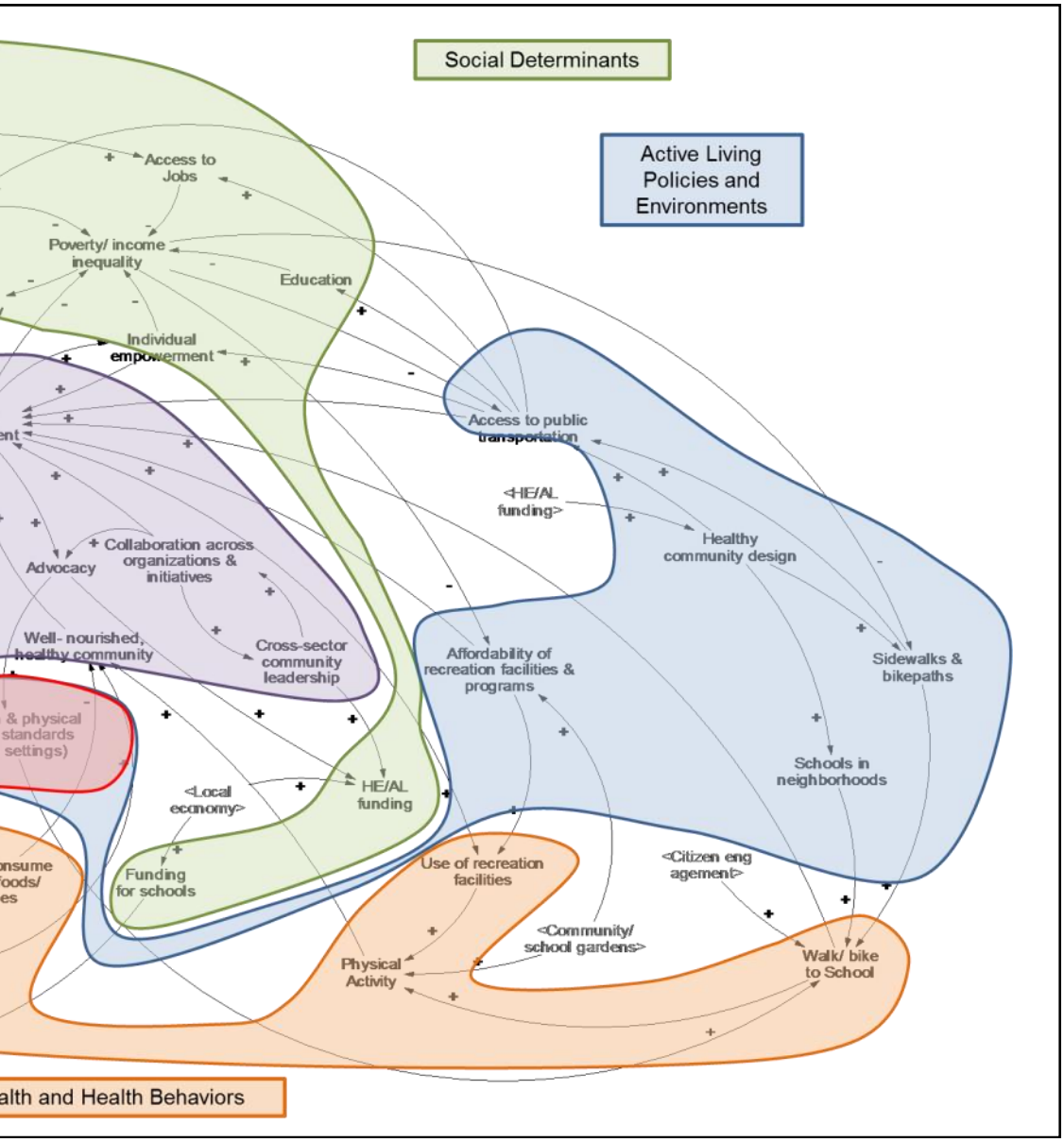
The active living policy and environmental subsystem includes design, planning, construction, and enforcement or maintenance related to access to opportunities for active transportation and recreation. For this topic, the group model building participants developed graphs related to policy or environmental strategies (e.g., physical activity standards in youth settings) or contexts (e.g., affordability of recreation facilities and programs) that affected or were affected by the partnership's work.

Health and Health Behaviors (Orange)

The subsystem for health and health behaviors includes health outcomes (e.g., obesity), health behaviors (e.g., healthy eating, physical activity), and behavioral proxies or context-specific behaviors (e.g., family meals at home, use of recreation facilities).

Partnership and Community Capacity

The partnership and community capacity subsystem refers to the ways communities organized and rallied for changes to the healthy eating and active living subsystems. For instance, *WeTHRIVE!* encouraged collaboration across organizations and initiatives. This subsystem also includes community factors outside the partnership that may influence or be influenced by their efforts, such as cultural competence of personnel.



Social Determinants

Finally, the social determinants subsystem denotes societal conditions (e.g., access to jobs) and psychosocial influences (e.g., individual empowerment) in the community that impact health beyond the healthy eating and active living subsystems. In order to achieve health equity, populations and subgroups within the community must have equitable access to these resources and services.

Each one of these subsystems has many more variables, causal relationships (arrows), and feedback loops that can be explored in greater depth by the *WeTHRIVE!* partners or by other representatives in Hamilton County, Ohio. Using this CLD as a starting place, community conversations about different theories of change within subsystems may continue to take place.

The next sections begin to examine the feedback loops central to the work of Hamilton County, Ohio. In these sections, causal relationships and notations (i.e., arrows, “+” signs, “-” signs) from Figure 2 will be described to increase understanding about how systems thinking and modeling tools can work in communities to increase understanding of complex problems that are continuously changing over time, such as childhood obesity. At the end of this CLD storybook, references to other resources will be provided for those interested in more advanced systems science methods and analytic approaches.

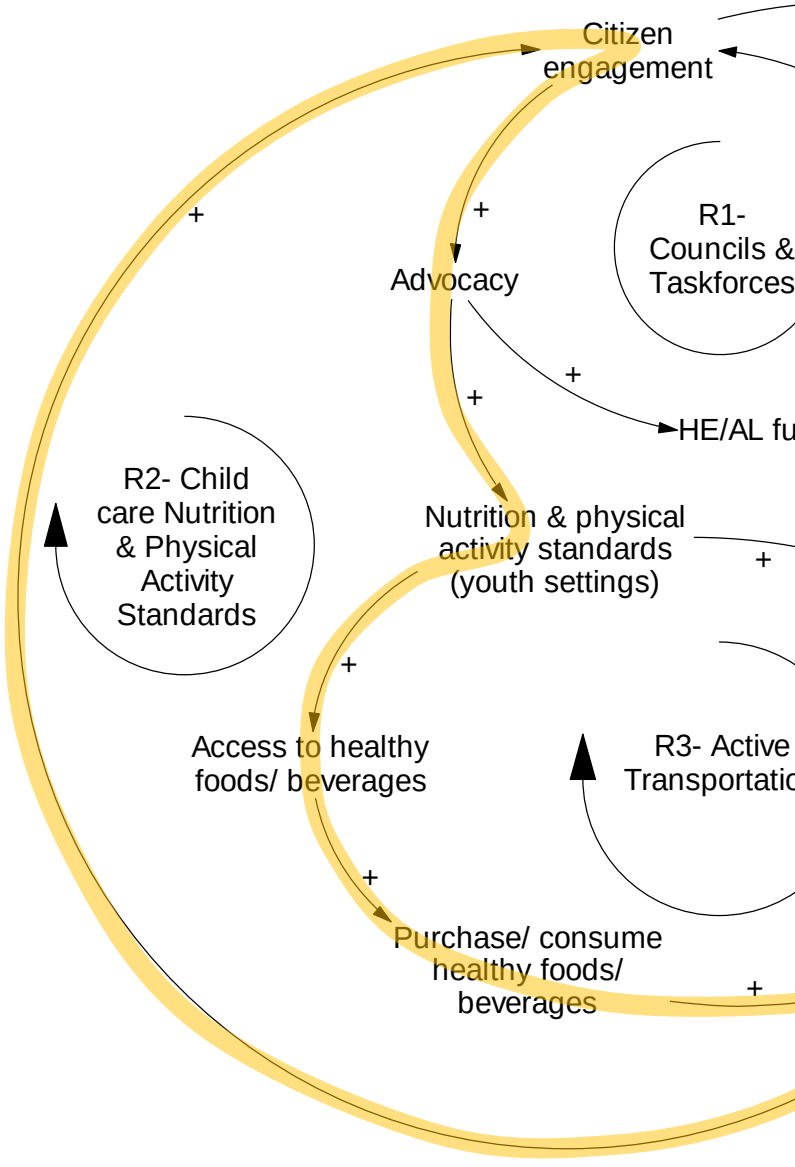
Child Care Nutrition and Physical Activity Standards Feedback Loop

To simplify the discussion about feedback loops, several loops drawn from the WeTHRIVE! CLD (see Figures 1 and 2) are highlighted in Figures 3-5. While the CLD provides a theory of change for the childhood obesity prevention movement in Hamilton County, Ohio, each feedback loop tells a story about a more specific change process.

Causal Story for Feedback Loop

Story A: In this case , the story is about the improvement of nutrition and physical activity standards in child care settings (orange highlighted loop in Figure 3). Hamilton County, Ohio partners increased access to healthier foods and beverages, limited screen time, and increased active play. Participants described how nutrition and physical activity standards created access to healthy foods and beverages, increasing purchase and consumption of these products. In turn, better nutrition increases the number of well-nourished, healthy community members. These healthy citizens can be more engaged in advocacy efforts to further improve nutrition and physical activity standards in child care settings.

Figure 3: Child Care Nutrition and Physical Activity Standards Feedback Loop



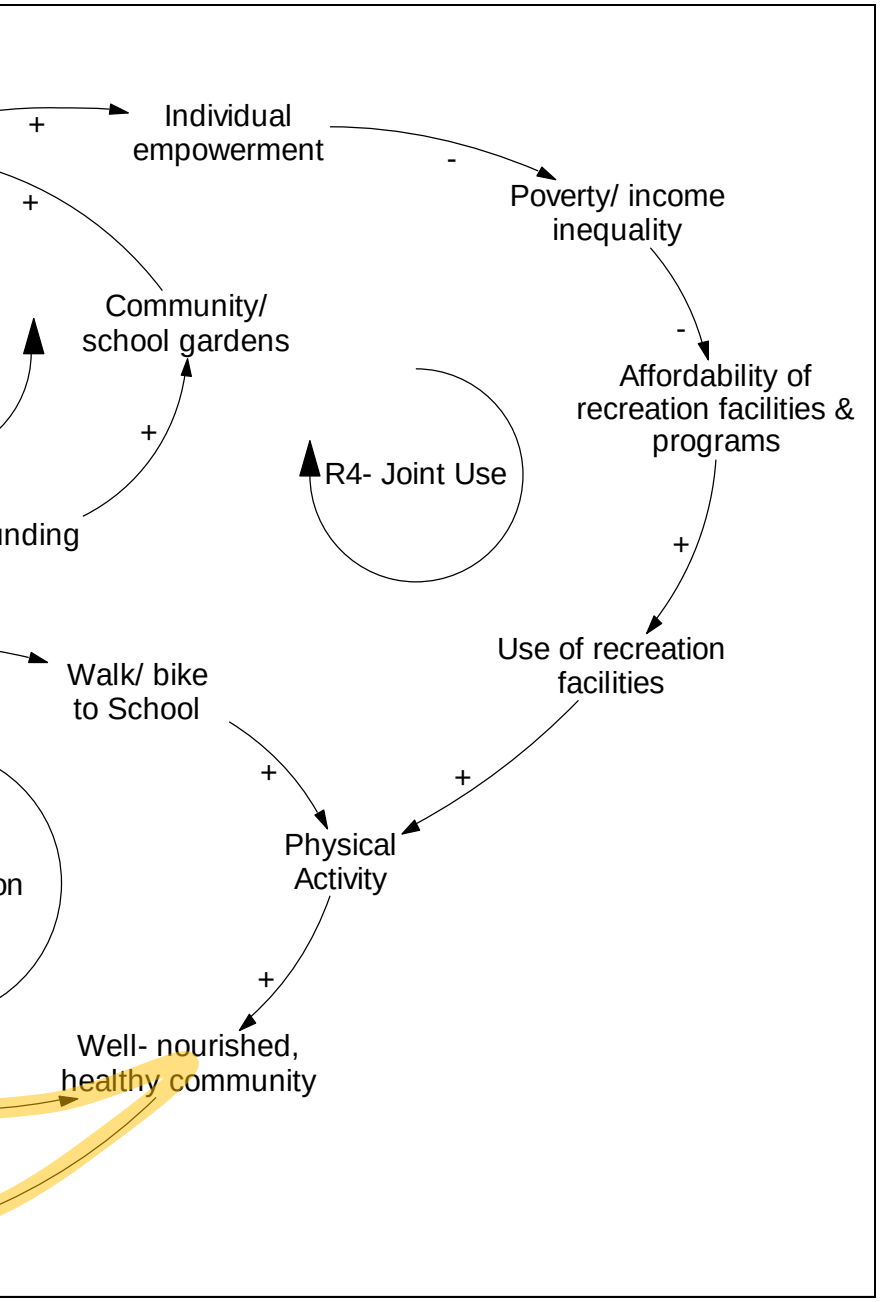
Story B: While the preceding story reflected a positive scenario for Hamilton County, Ohio, the same feedback loop also tells the opposite story. The absence of these types of standards may result in less access to healthy foods and beverages, worse nutrition, and less healthy citizens. Consequently, these individuals are likely to be less engaged in advocacy efforts to improve nutrition and physical activity standards.

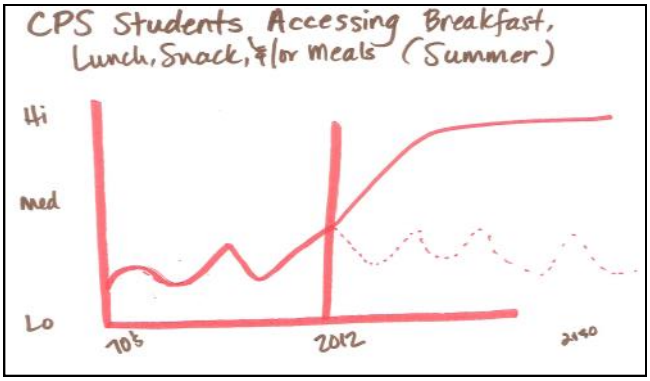
Reinforcing Loop and Notation

These stories — pro and con — represent a reinforcing loop, and the notation in the feedback loop identifies it as a reinforcing loop (see "R2 — Child Care Nutrition and Physical Activity Standards" and orange highlighted loop in Figure 3). The words represent variables of quantities that increase and decrease as illustrated in the stories above. These variables change over time and are influenced by other variables as indicated by the arrows. Each arrow represents a causal relationship, and the plus and minus signs on the arrows indicate whether or not the influence of one variable on another variable (1) increases/adds to (plus or "+" sign), or (2) decreases/removes from the other variable (minus or "-" sign). These signs are referred to as polarities.

"I think a lot more child care centers have actually had nutrition and physical activity standards, as far back as the 1970s, but maybe haven't put them into practice. And I think more recently, more centers have been putting them into practice, in terms of after-school programs and child care. There's been a lot more attention paid to it and a lot more tools provided to people in the last couple of years, even though it's always been a priority in those particular areas." (Participant)

In a reinforcing loop, the effect of an increase or decrease in a variable continues through the cycle and returns an increase or decrease to the same variable, respectively. Looking specifically at the "+" or "-" notation, a feedback loop that has zero or an even number of "-" signs, or polarities, is considered a reinforcing loop. Balancing loops, with an odd number of "-" signs in the loop, are another type of feedback loop.



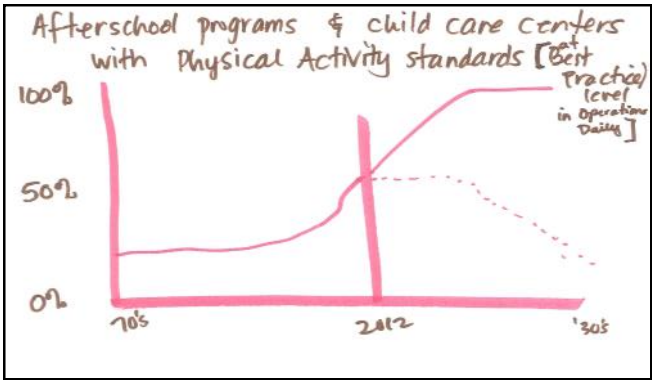


In isolation, this reinforcing loop represents a virtuous cycle in Story A as these assets positively support one another, or a vicious cycle in Story B as these challenges perpetuate a downward spiral. Yet, the influence of child care nutrition and physical activity standards likely levels off at some point when the standards have been successfully implemented across child care settings. To understand other influences on these variables, it is important to remember that this reinforcing loop is only one part of the larger CLD (see Figures 1 and 2), and the other loops and causal relationships can have an impact on the variables in this loop.

<u>System Insights for *WeTHRIVE!*</u>

Participants identified a relatively low number of Cincinnati Public School students accessing summer meals as well as a relatively low proportion of child care settings with physical activity standards in Hamilton County, Ohio, with both of these trends showing more recent increases (see behavior over time graphs).

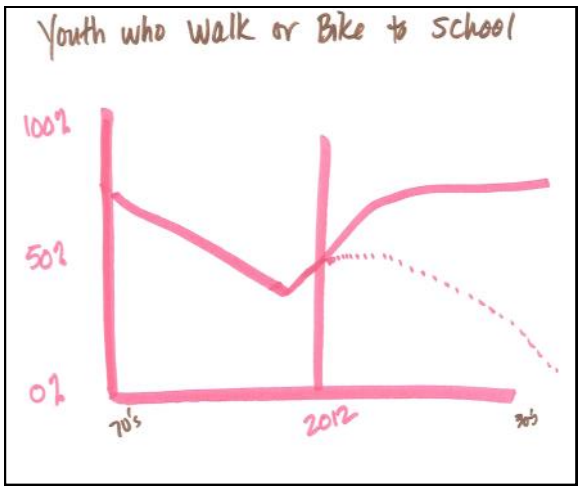
From the systems thinking exercises, several insights can inform ongoing work to improve nutrition and physical activity in child care settings. For instance, the partners' work to create a food policy council, food access taskforce, and ambassadors can bolster citizen engagement and advocacy efforts to ensure that all child care settings develop, implement, and enforce quality nutrition and physical activity standards.



In addition to system insights, systems thinking can also help to pose key questions for assessment and evaluation, including efforts to evaluate the :"key ingredients" of successful standards in child care settings.

Safe Routes to School Feedback Loop

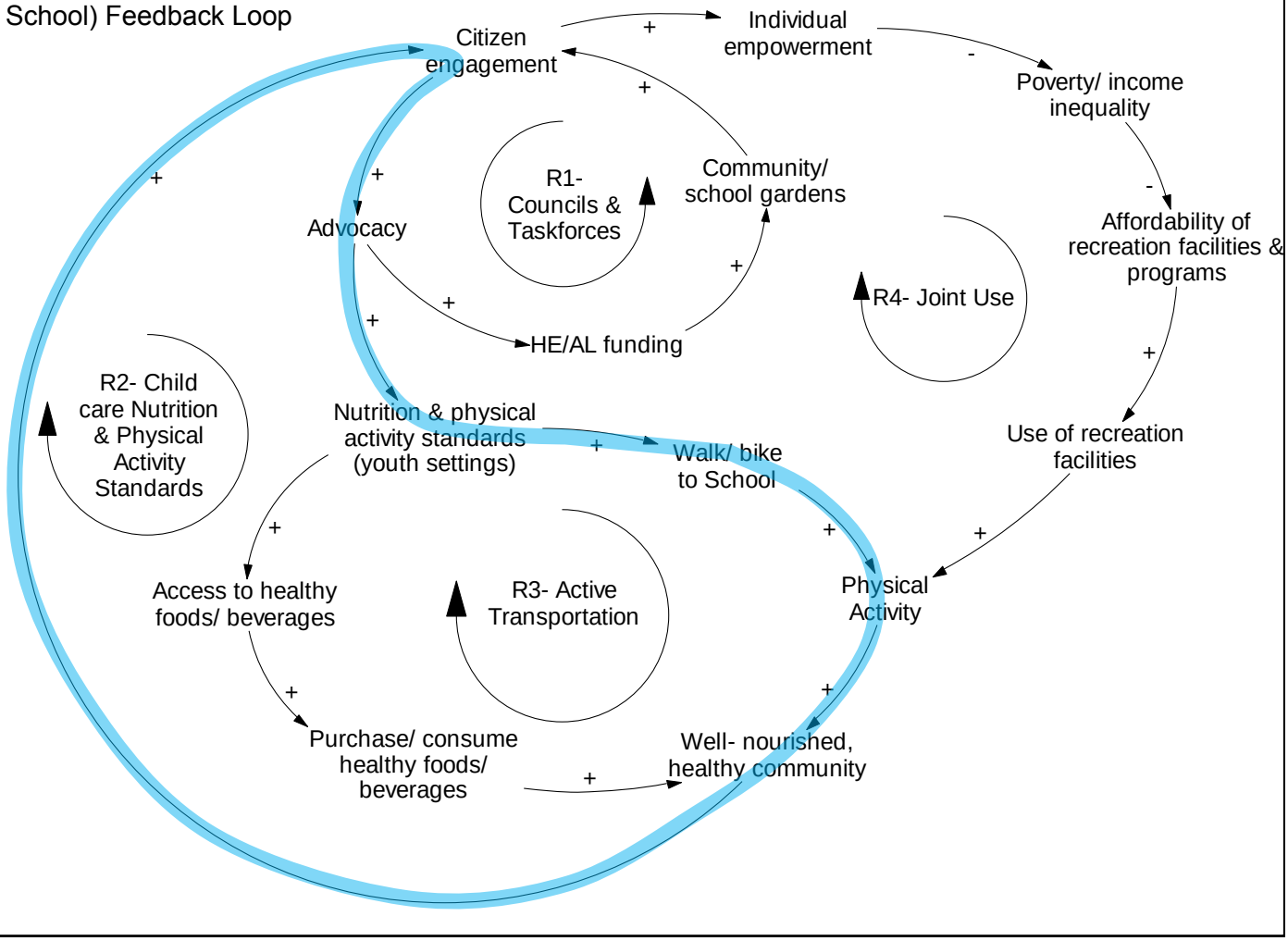
The feedback loop highlighted in blue in Figure 4 reflects the same concepts and notation, and highlights active transportation in Hamilton County, Ohio. Like the child care nutrition and physical activity standards loop in Figure 3, this loop also represents a reinforcing loop (all "+" signs). Additionally, this loop shows how a well-nourished, healthy community increases civic engagement and advocacy efforts to generate nutrition and physical activity standards; yet, this loop focuses on infrastructure to support walking and biking to school in order to increase physical activity.



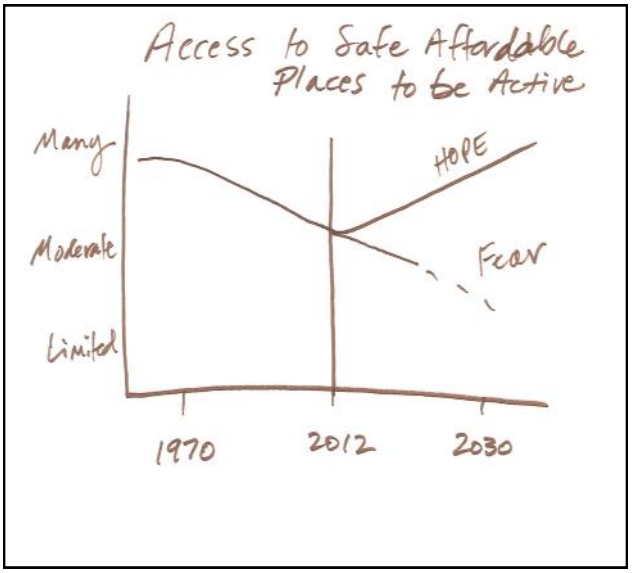
In the behavior over time graphs exercise, participants also described how there was more walking and biking to school in the past, and how recently the declining trend has shifted to an increasing pattern once again.

"My perception is that many more young people used to walk or bike to school. Maybe it was safer, maybe it was closer to walk, maybe there were neighborhood schools; and then, at some point [this trend] dipped, hit a peak, and then started back up. Maybe it's because, as we know, in the past couple of years, the school district changed the boundaries, so more walkers were kind of forced by policy to walk or bike to school, which is a good thing from this perspective. And it would be nice to get it back up to what my perception was that, you know, maybe around 75% had the ability to walk or bike to school safely and enjoy." (Participant)

Figure 4: Active Transportation (Safe Routes to School) Feedback Loop



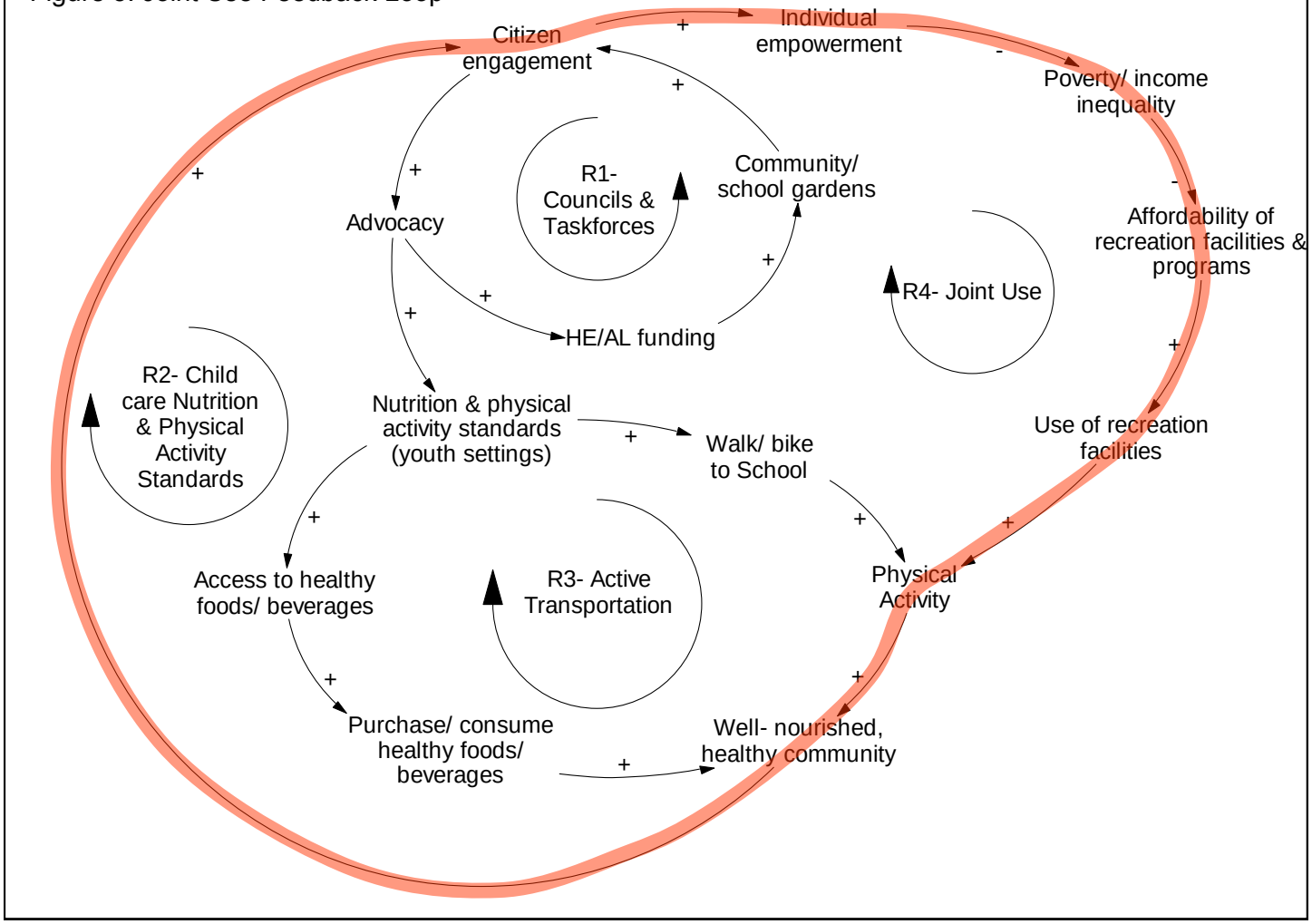
Joint Use Feedback Loop



Highlighted in red in Figure 5, the joint use feedback loop represents one of the *WeTHRIVE!* strategies to increase active living in Hamilton County, Ohio. Similar to the previous loops, this one also represents a reinforcing loop (two "-" signs). In addition, it includes causal relationships representing more immediate effects (e.g., affordability of recreation facilities and programs affecting use of these facilities), and, potentially, delayed effects (e.g., individual empowerment causing a reduction in poverty and income inequality). This delayed effect is noted using two hash marks through the middle of the arrow line (not included in Figure 5).

In the behavior over time graphs exercise, participants described a decrease in access to safe, affordable places to be active over the last several decades, with the hope that these places become available again into the future. Partners' efforts to design a planning and engagement approach to secure shared use agreements with communities and churches helps to address the affordability of play spaces, particularly for those who have limited resources to spend on recreation. Complemented by other strategies designed to increase physical activity in Hamilton County, Ohio, such as Safe Routes to School, joint use agreements can contribute to overall increases in the number of well-nourished, healthy community members.

Figure 5: Joint Use Feedback Loop



Opportunities for Systems Thinking in Hamilton County, Ohio

This storybook provided an introduction to some basic concepts and methods for systems thinking at the community level, including: causal loop diagrams, variables, causal relationships and polarities, reinforcing feedback loops, and balancing feedback loops, among others. For the *WeTHRIVE!* partners, this storybook also summarized the healthy eating, active living, partnership and community capacity, social determinants, and health and health behaviors subsystems in the Hamilton County, Ohio causal loop diagram as well as three specific feedback loops corresponding to the partnership's primary strategies.

This causal loop diagram reflects a series of conversations among partners and residents from 2011 to 2013. Some discussions probed more deeply into different variables through the behavior over time graphs exercise, or causal relationships through the causal loop diagram exercise.

This represented a first attempt to collectively examine the range of things that affect or are affected by policy, system, and environmental changes in Hamilton County, Ohio to promote healthy eating and active living as well as preventing childhood overweight and obesity.

Yet, there are several limitations to this storybook, including:

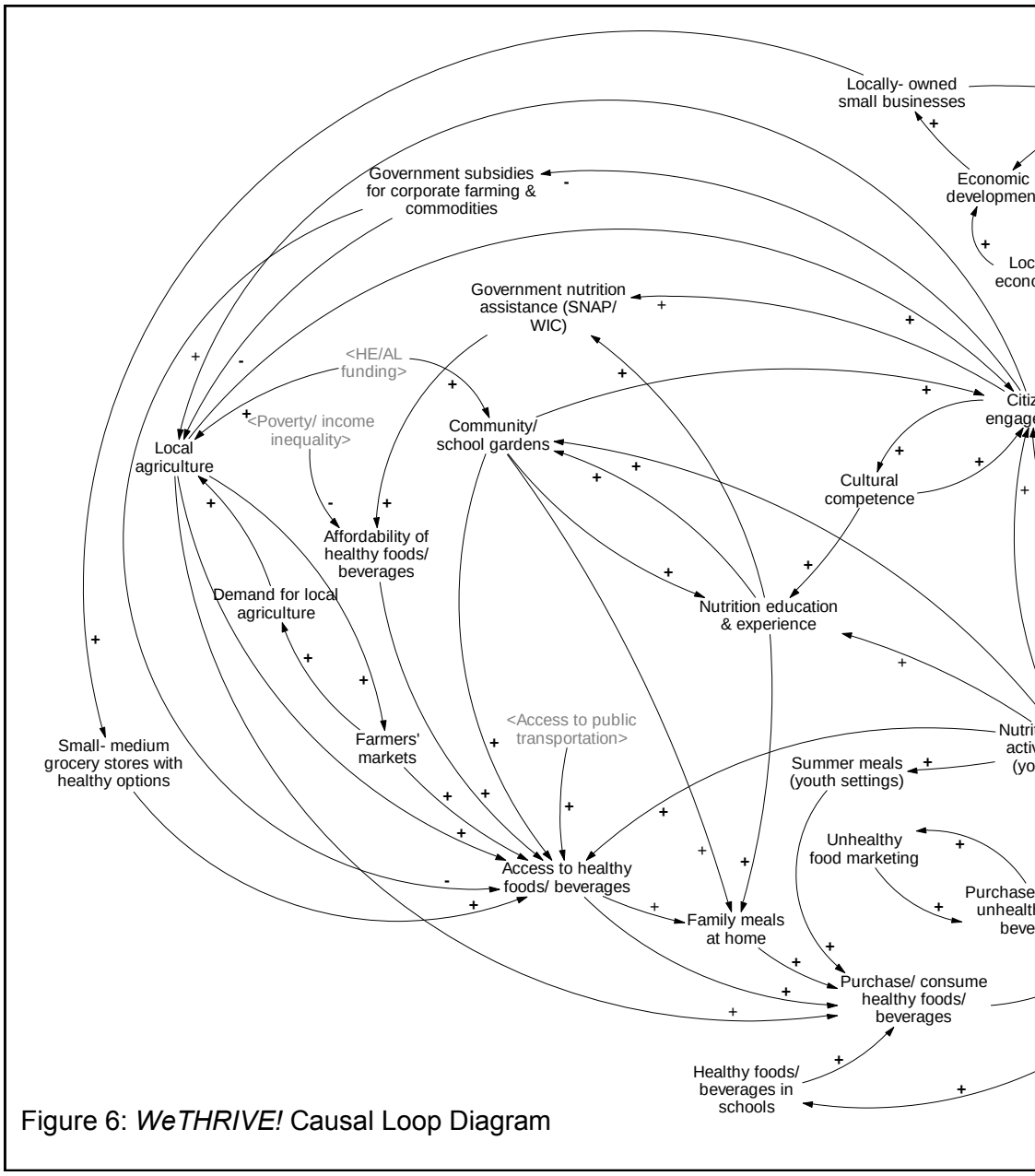
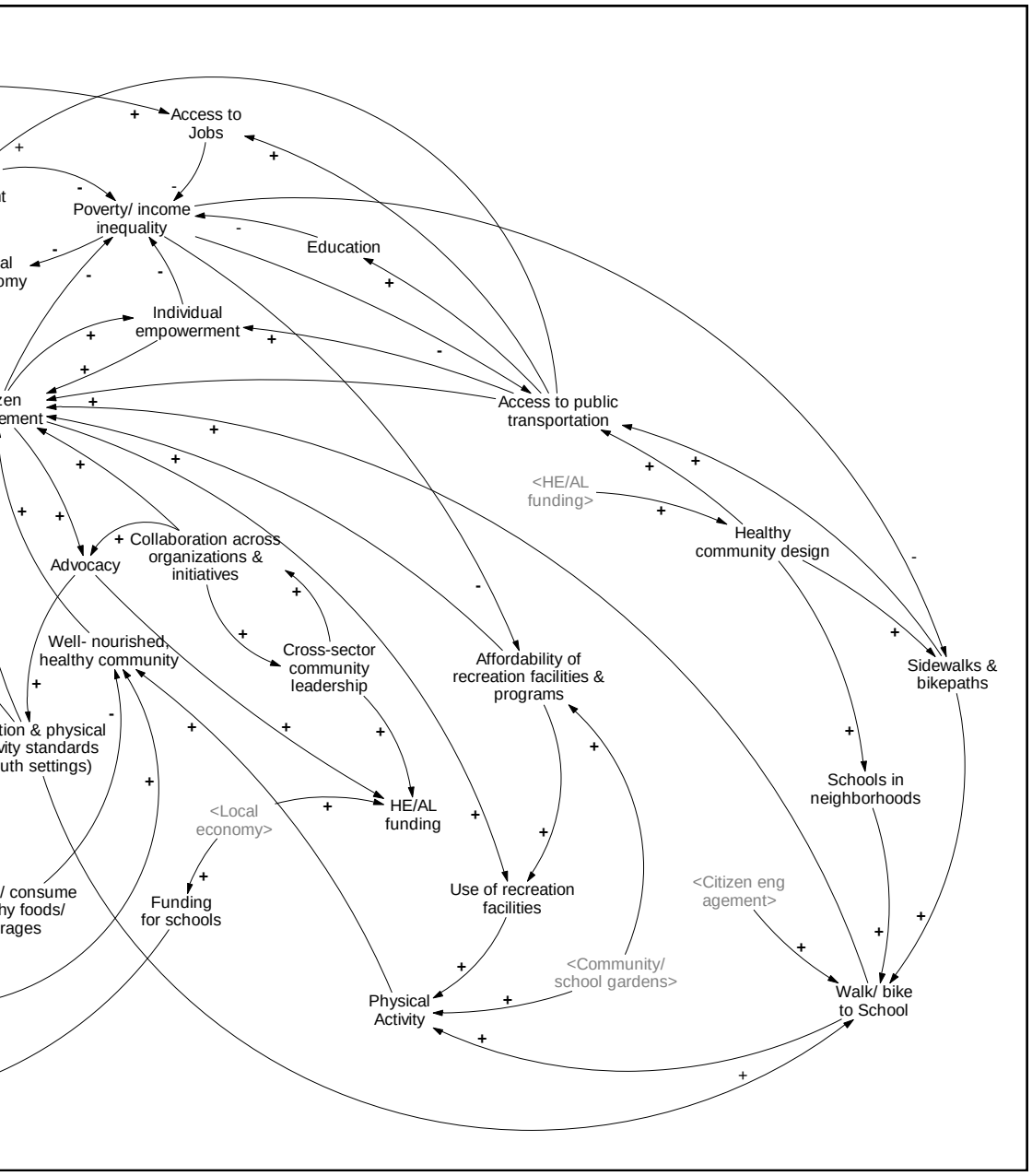


Figure 6: *WeTHRIVE!* Causal Loop Diagram

- the participants represent a sample of the *WeTHRIVE!* partners (organizations and residents) as opposed to a representative snapshot of government agencies, community organizations, businesses, and community residents;
- the behavior over time graphs and the causal loop diagram represent perceptions of the participants in these exercises (similar to a survey or an interview representing perceptions of the respondents);
- the exercises and associated dialogue took place in brief one- to two-hour sessions, compromising the group's capacity to spend too much time on any one variable, relationship, or feedback loop; and
- the responses represent a moment in time so the underlying structure of the diagram and the types of feedback represented may reflect "hot button" issues of the time.

Much work is yet to be done to ensure that this causal loop diagram is accurate and comprehensive, for example:

- having conversations to discuss existing feedback loops to ensure that the appropriate variables and relationships are represented accurately;



- reviewing the behavior over time graphs (see also Appendix E) to confirm that the trends reflect common perceptions among residents and compare these trends to actual data;
- revisiting variables removed because they were not part of feedback loops, including perceptions of crime, urban sprawl, community safety, affordability of health care, unhealthy food/beverage vendors, healthy food/ beverage advertising; and
- starting new conversations about other variables (behavior over time graphs exercise) or relationships (causal loop diagram exercise) to add to this diagram.

In addition, different subgroups in Hamilton County, Ohio may use this causal loop diagram to delve in deeper into some of the subsectors (e.g., healthy eating, active living) or feedback loops, creating new, more focused causal loop diagrams with more specific variables and causal relationships.

Use of more advanced systems science methods and analytic approaches to create computer simulation models is another way to take this early work to the next level. The references section includes citations for resources on these methods and analytic approaches, and it is necessary to engage professional systems scientists in these activities.

Please refer to the Appendices for more information, including:

- Appendix A: Behavior over time graphs generated during site visit
- Appendix B: Photograph of the original version of the *WeTHRIVE!* Causal Loop Diagram
- Appendix C: Original translation of the causal loop diagram into Vensim PLE
- Appendix D: Transcript translation of the causal loop diagram into Vensim PLE
- Appendix E: Behavior over time graphs not represented in the storybook

References for Systems Thinking in Communities:

Group model building handbook:

Hovmand, P., Brennan L., & Kemner, A. (2013). Healthy Kids, Healthy Communities Group Model Building Facilitation Handbook. Retrieved from http://www.transtria.com/hkhc.

Vensim PLE software for causal loop diagram creation and modification:
Ventana Systems. (2010). Vensim Personal Learning Edition (Version 5.11A) [Software]. Available from http://vensim.com/vensim-personal-learning-edition/

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Rouwette, E., et al. (2006). "Group model building effectiveness: A review of assessment studies." System Dynamics Review 18(1): 5-45.

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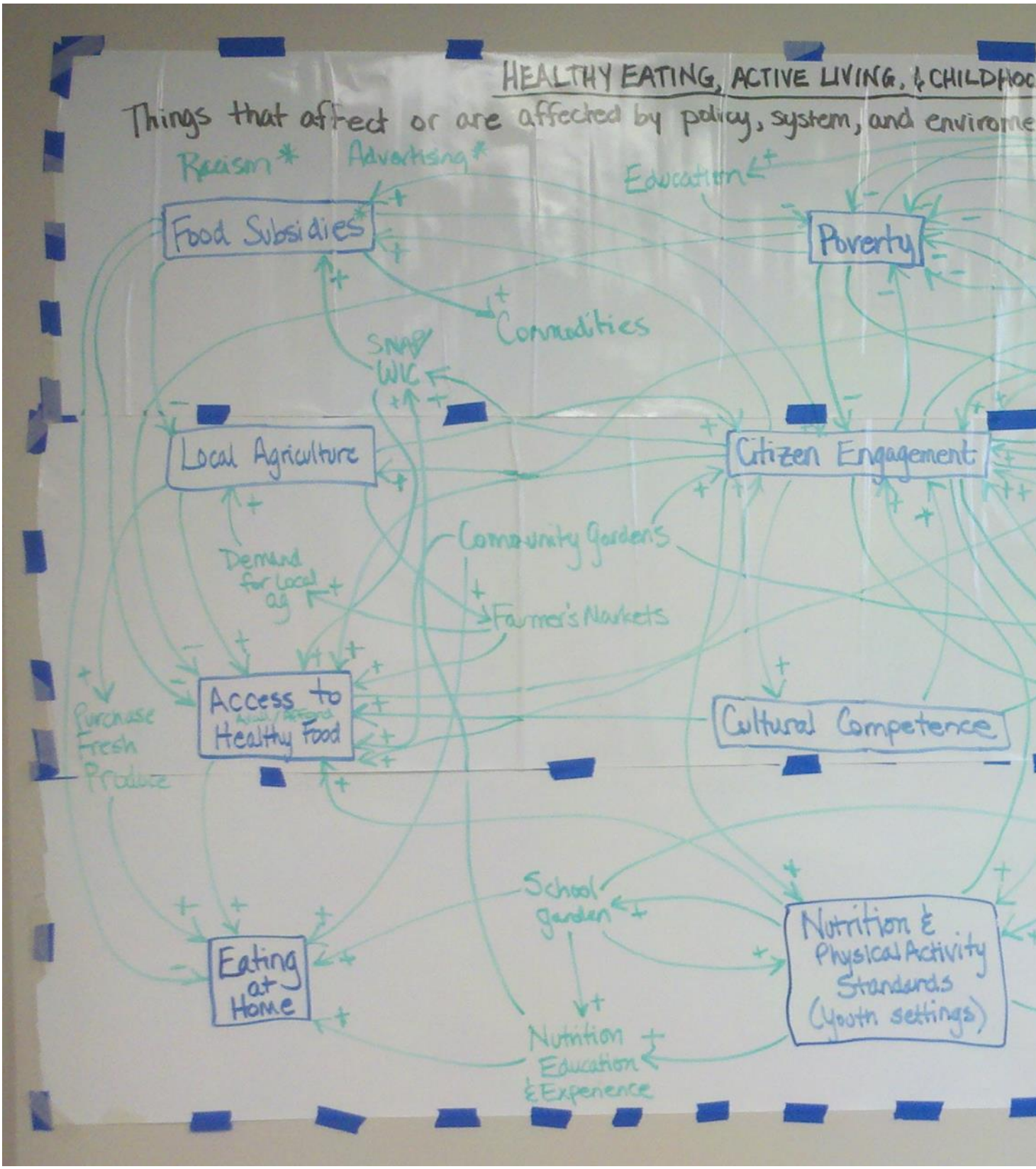
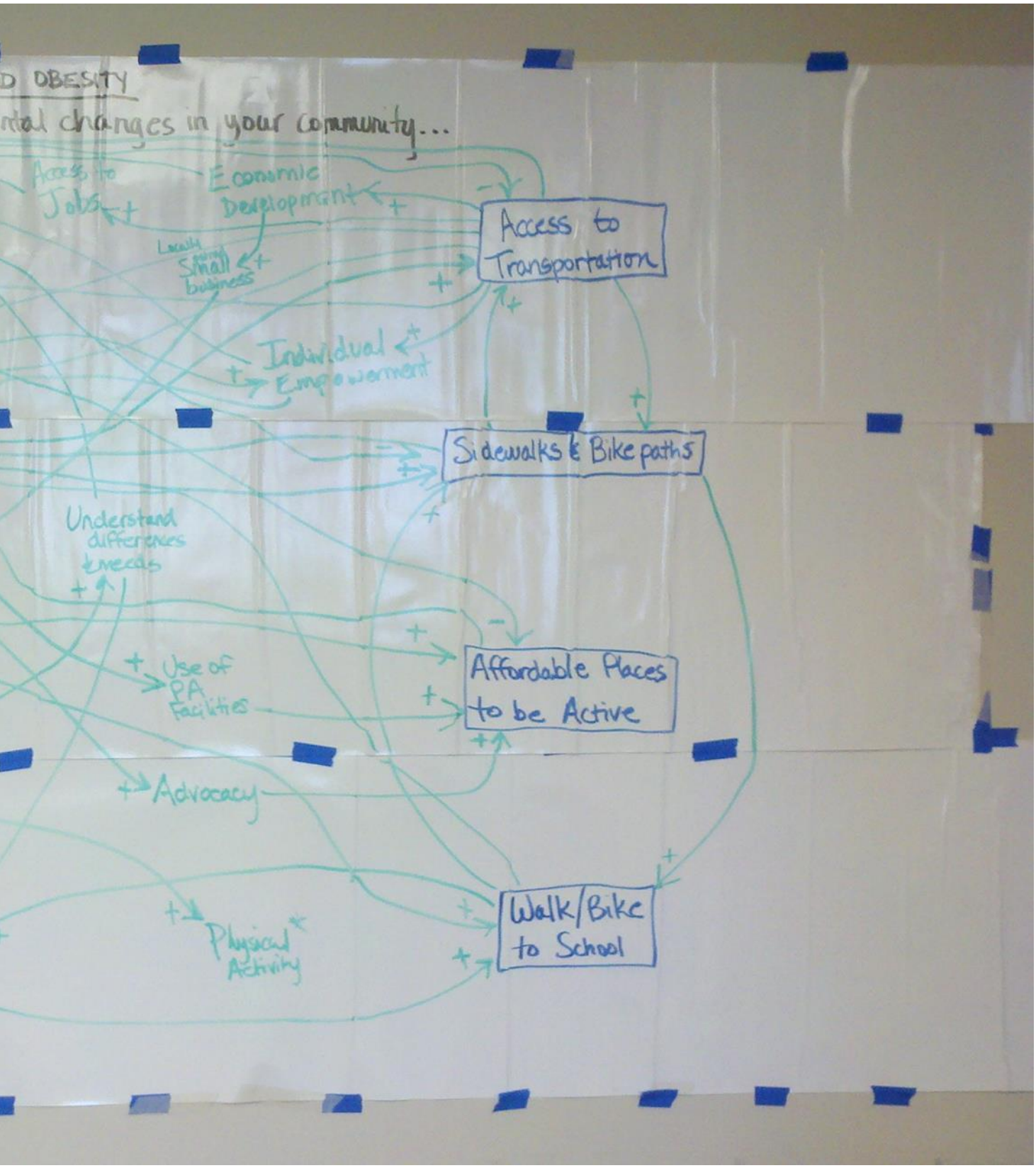
Appendix A: Behavior Over Time Graphs Generated during Site Visit

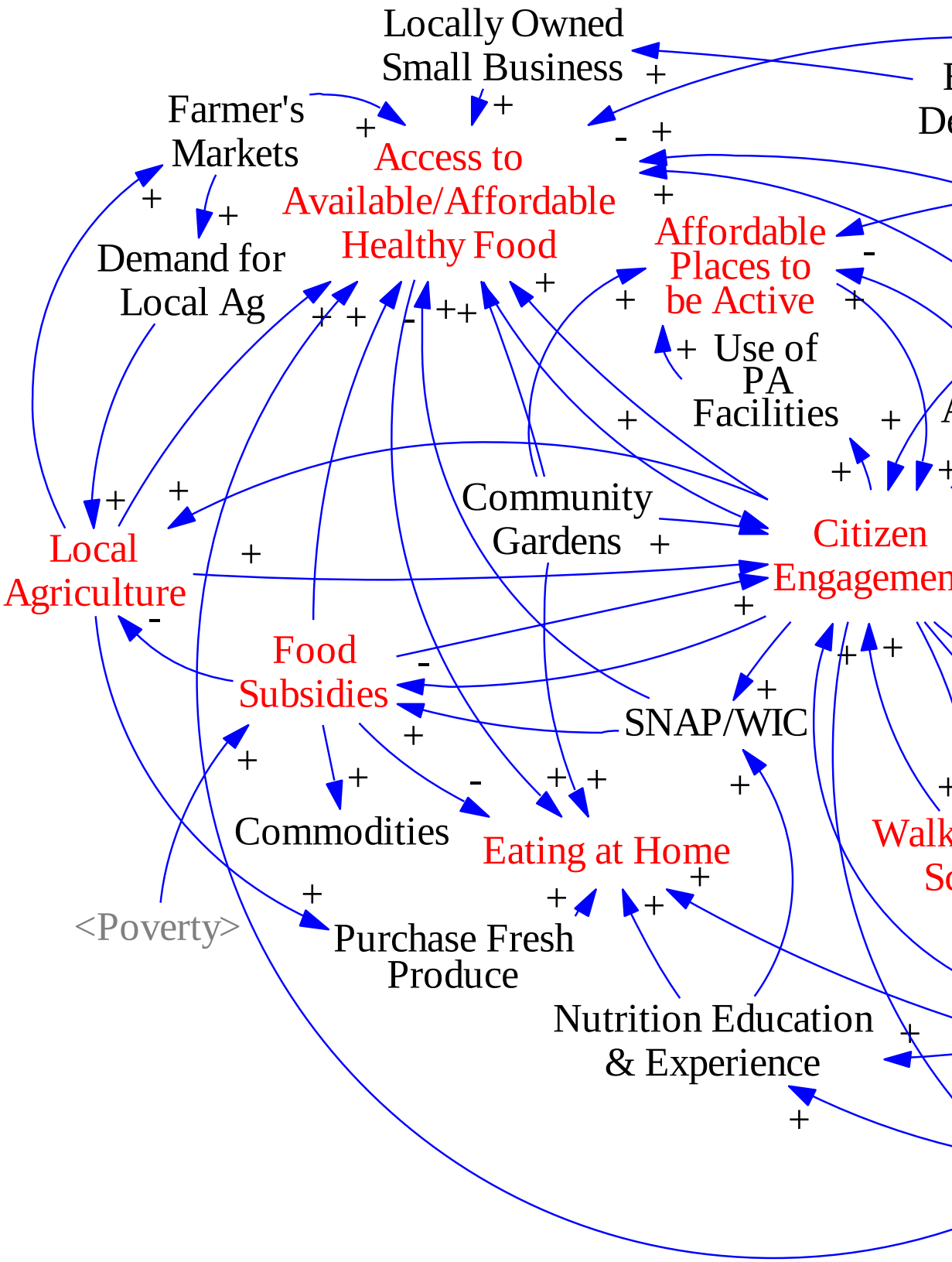
Hamilton County, Ohio: *WeTHRIVE!*	
Categories	**Number of Graphs**
Active Living Behavior	1
Active Living Environments	4
Funding	3
Healthy Eating Behavior	1
Healthy Eating Environments	14
Marketing and Media Coverage	1
Obesity and Long Term Outcomes	0
Partnership & Community Capacity	5
Policies	3
Programs & Promotions (Education and Awareness)	5
Social Determinants of Health	2
Total Graphs	**40**

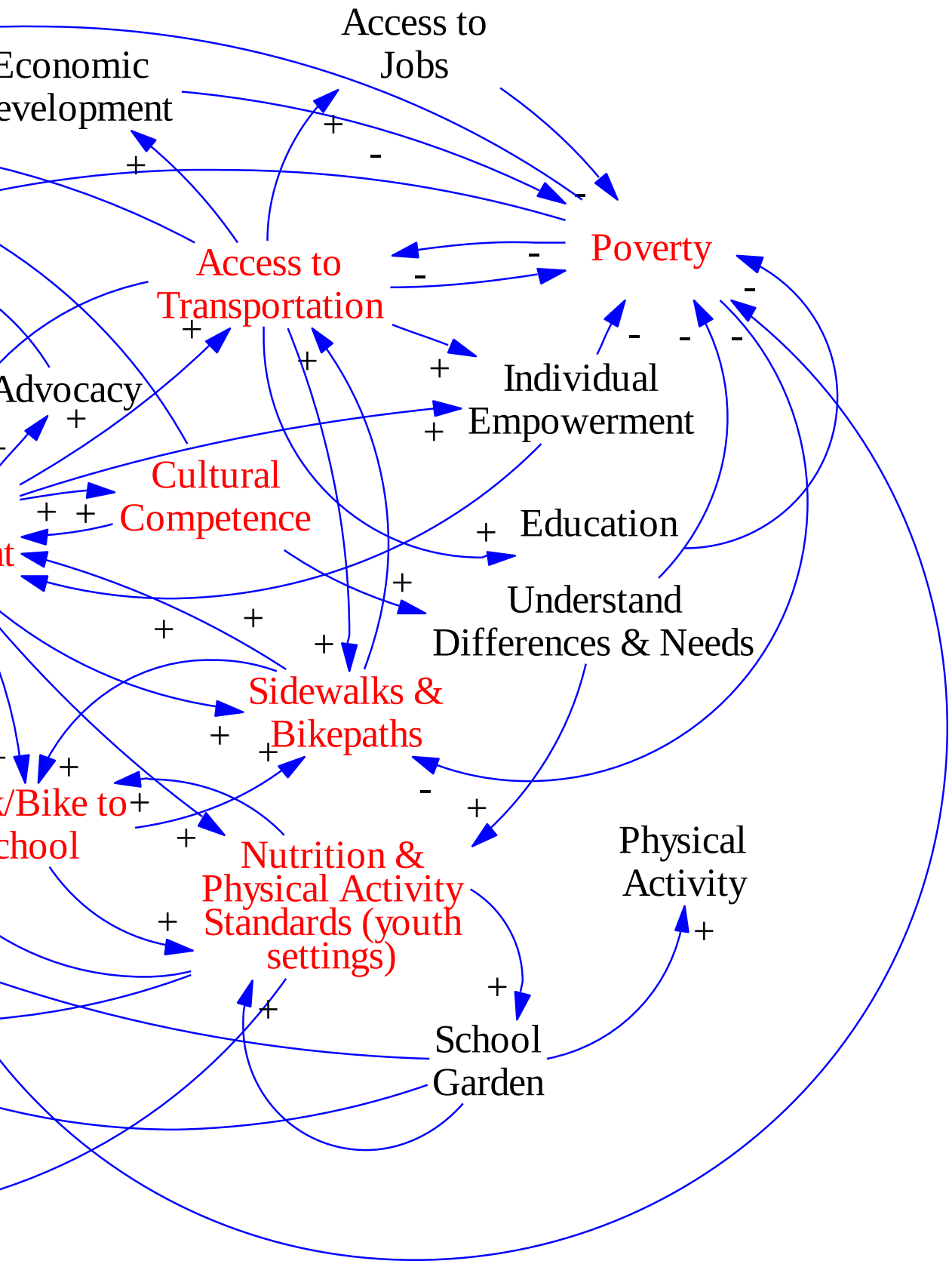
Appendix B: Photograph of the Original Version of the *WeTHRIVE!* Causal Loop Diagram



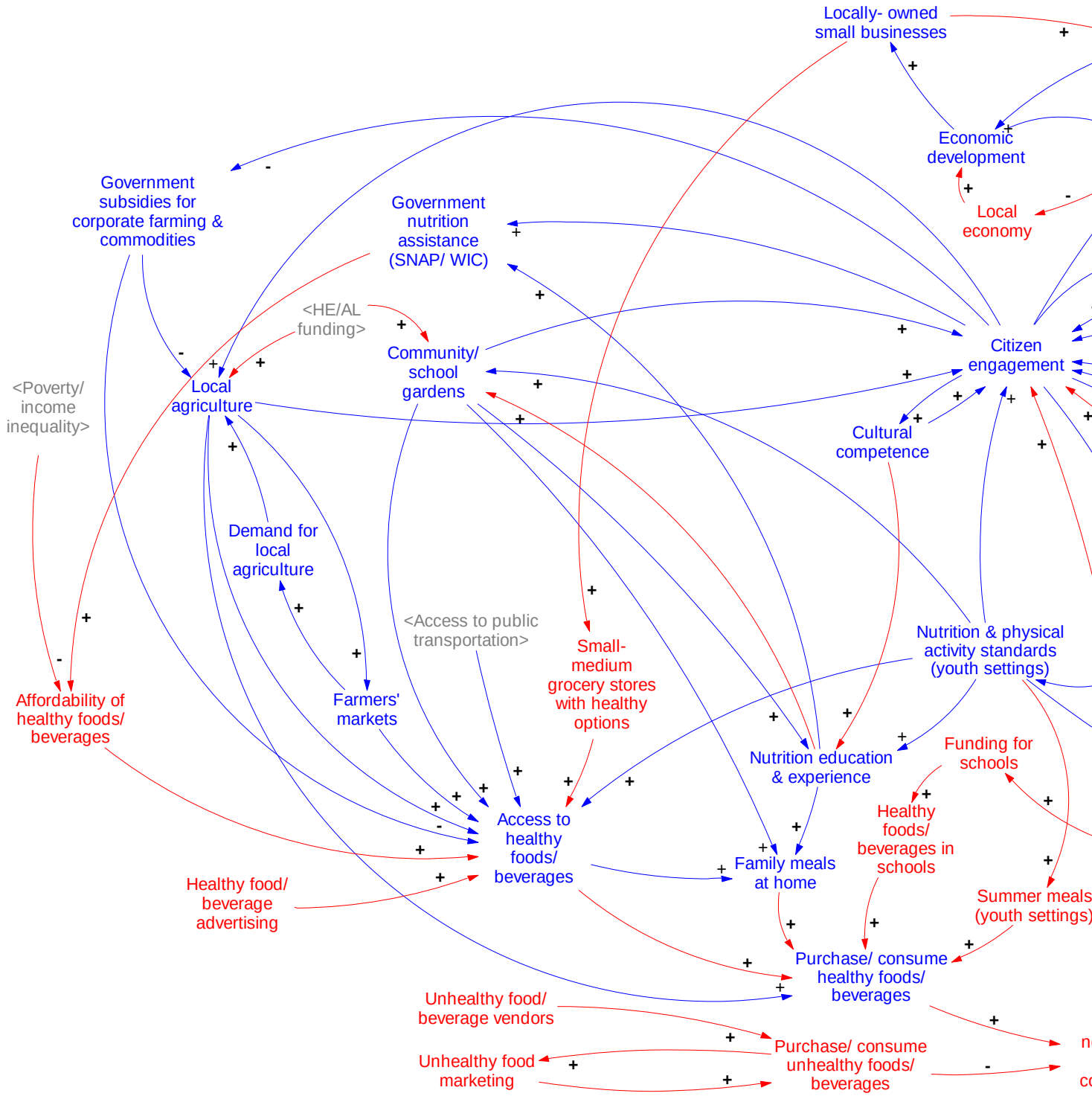

D OBESITY
ntal changes in your community...
Access to Jobs
Economic Development
Local small business
Access to Transportation
Individual Empowerment
Sidewalks & Bike paths
Understand differences & needs
Use of PA Facilities
Affordable Places to be Active
Advocacy
Physical Activity
Walk/Bike to School

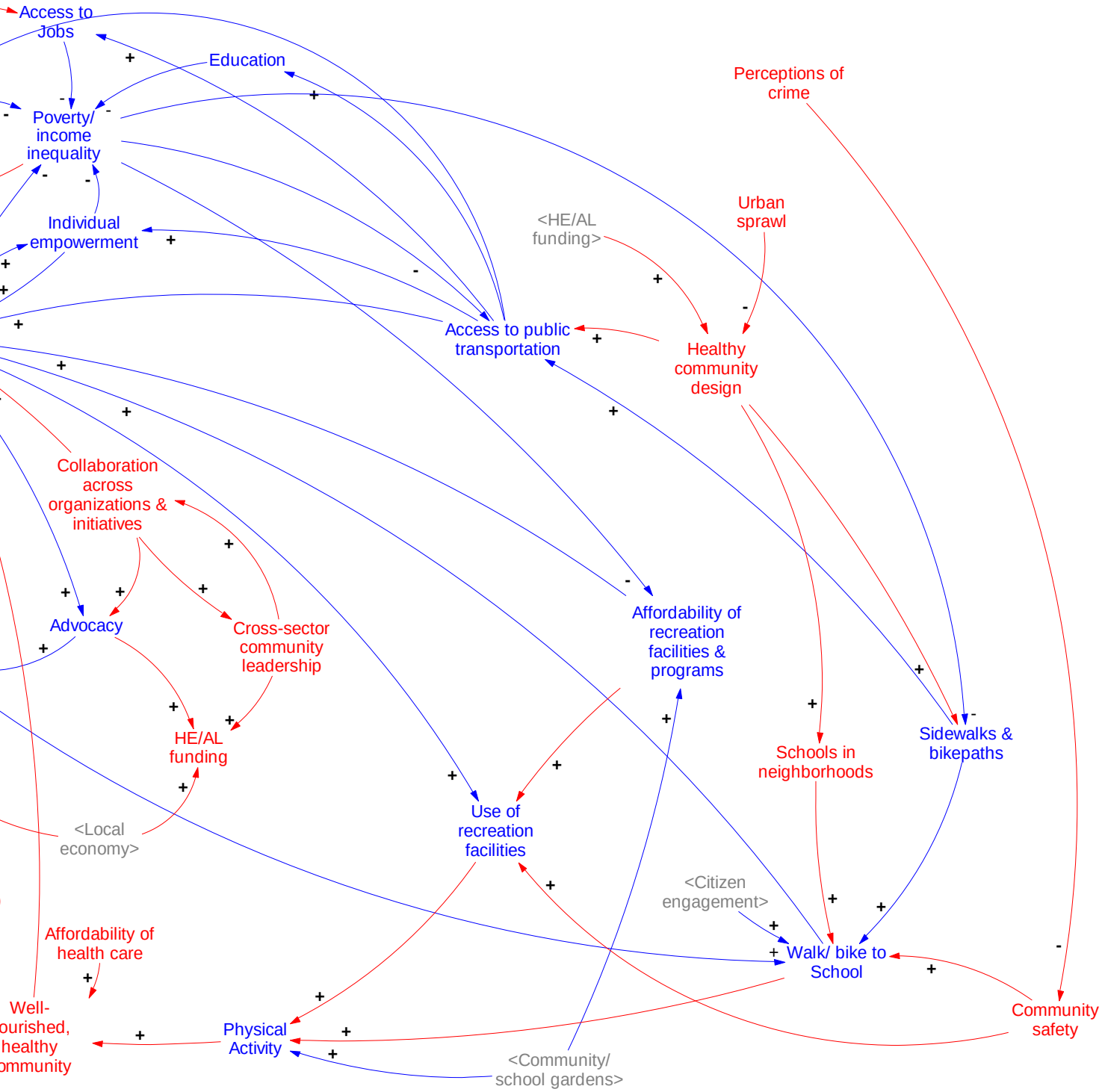
Appendix C: Original Translation of the Causal Loop Diagram into Vensim PLE



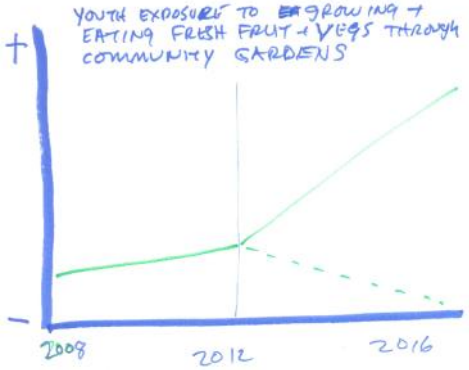

Access to
Jobs
Economic
evelopment
Poverty
Access to
Transportation
Advocacy
Individual
Empowerment
Cultural
Competence
Education
Understand
Differences & Needs
Sidewalks &
Bikepaths
/Bike to
chool
Nutrition &
Physical Activity
Standards (youth
settings)
Physical
Activity
School
Garden

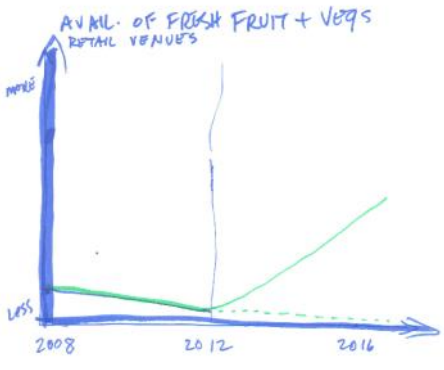
Appendix D: Transcript Translation of the Causal Loop Diagram into Vensim PLE

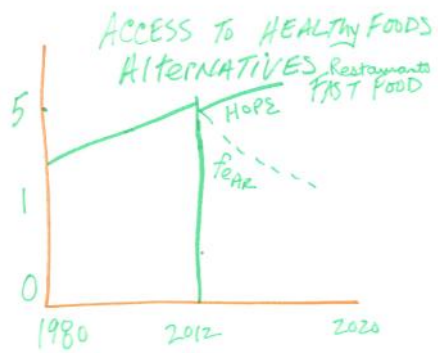


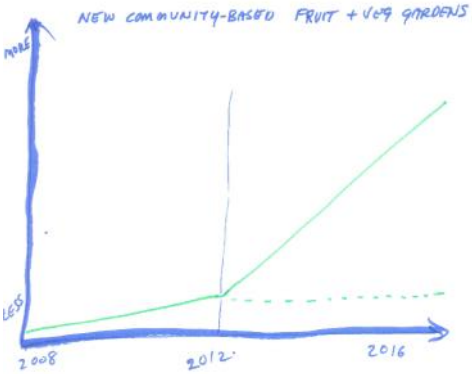

Access to Jobs
Education
Perceptions of crime
Poverty/ income inequality
Individual empowerment
<HE/AL funding>
Urban sprawl
Access to public transportation
Healthy community design
Collaboration across organizations & initiatives
Advocacy
Cross-sector community leadership
Affordability of recreation facilities & programs
HE/AL funding
Schools in neighborhoods
Sidewalks & bikepaths
<Local economy>
Use of recreation facilities
<Citizen engagement>
Affordability of health care
Walk/ bike to School
Well-ourished, healthy ommunity
Physical Activity
Community safety
<Community/ school gardens>

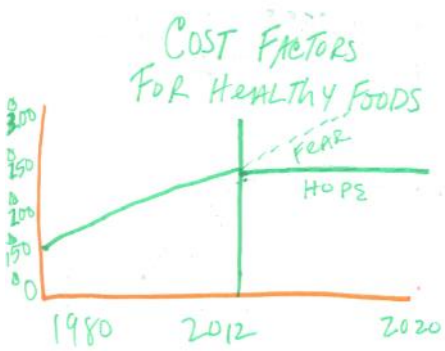
Appendix E: Behavior Over Time Graphs not Represented in the Storybook

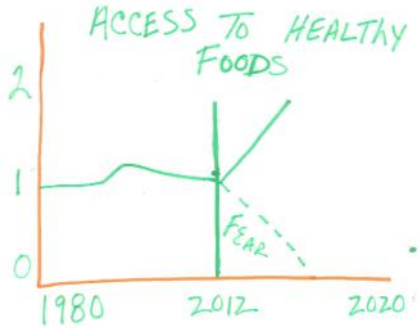


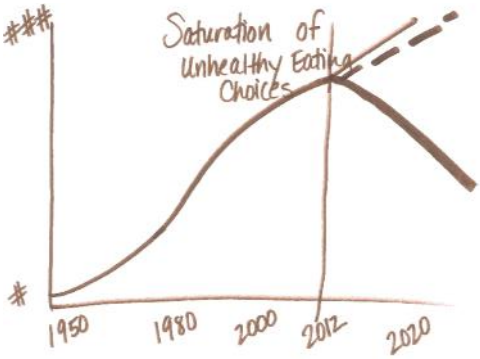


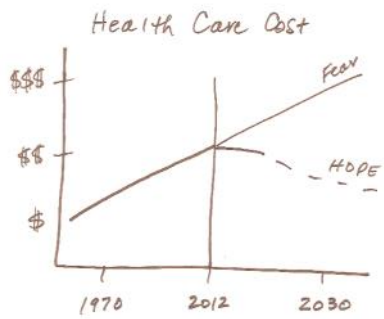


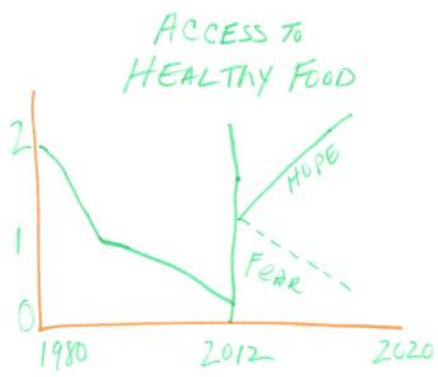


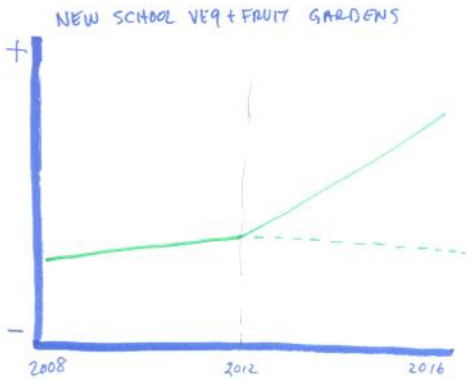


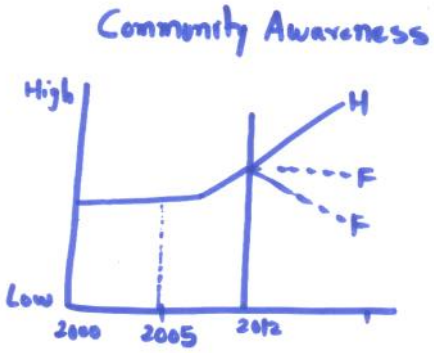


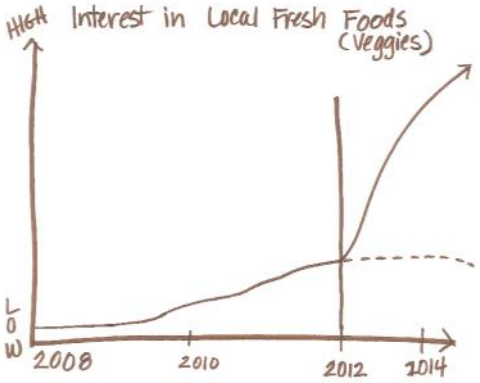




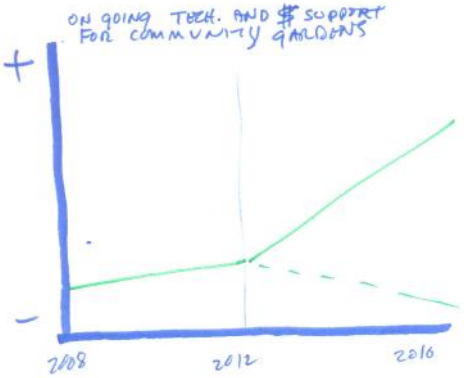


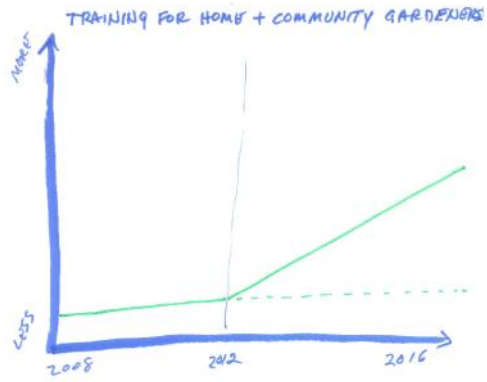


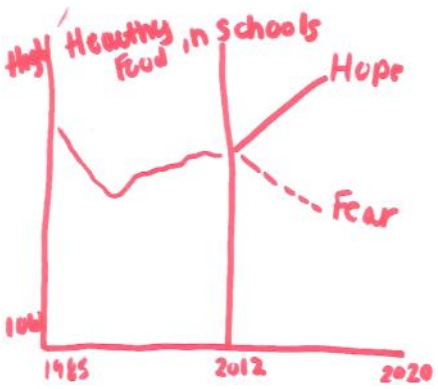

Community Awareness
High
Low
H
F
F
2000
2005
2012

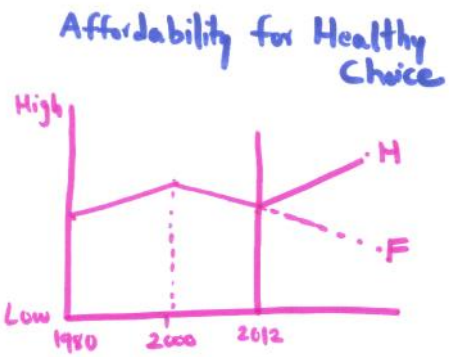

High
Interest in Local Fresh Foods
(Veggies)
L
O
W
2008
2010
2012
2014

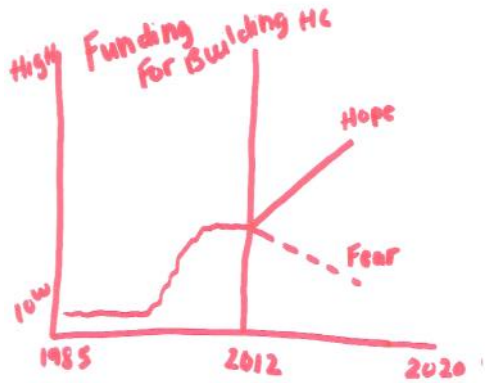

Committment of ~~political~~
leadership
High
Low
2008
2010
2012
2014

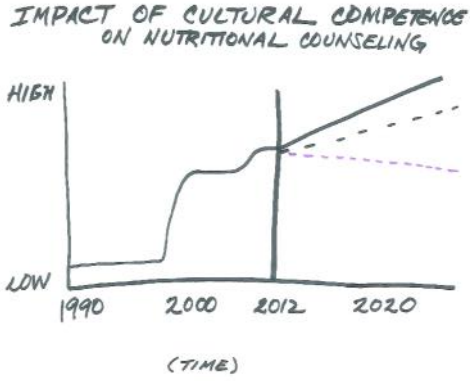

ON GOING TECH. AND $ SUPPORT
FOR COMMUNITY GARDENS
+
-
2008
2012
2016

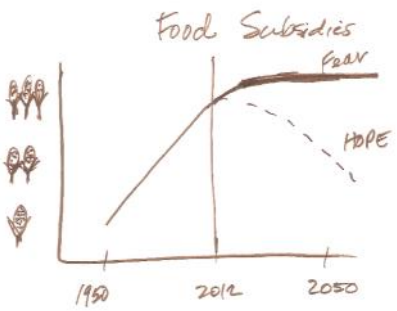

TRAINING FOR HOME + COMMUNITY GARDENERS
MORE
LESS
2008
2012
2016

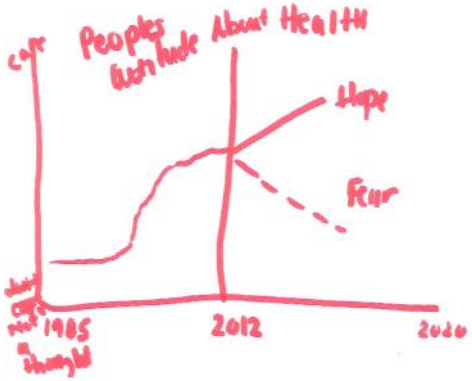

High
Healthy Food in Schools
Hope
Fear
low
1985
2012
2020

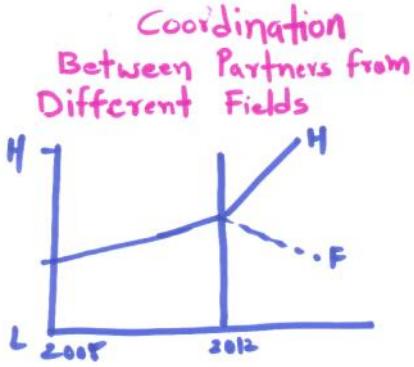

Affordability for Healthy Choice
High
Low
H
F
1980
2000
2012

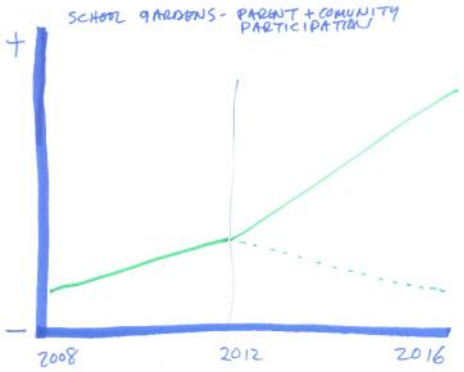

High
Funding for Building HC
Hope
Fear
low
1985
2012
2020

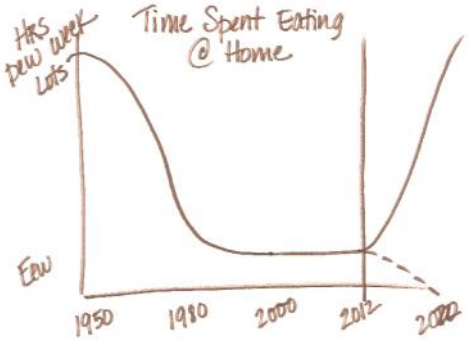

IMPACT OF CULTURAL COMPETENCE
ON NUTRITIONAL COUNSELING
HIGH
LOW
1990
2000
2012
2020
(TIME)

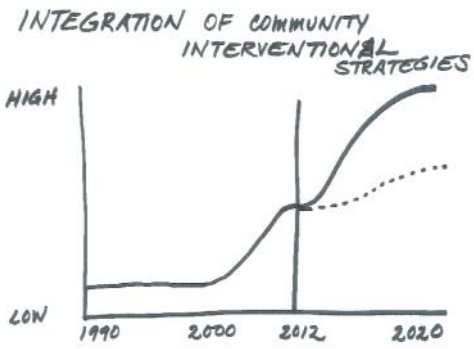

Food Subsidies
Fear
HOPE
1950
2012
2050

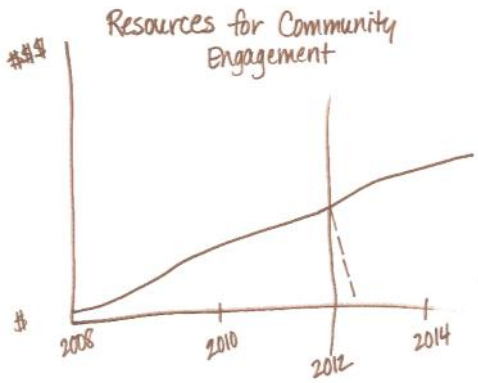

Peoples Attitude About Health
Hope
Fear
1985
2012
2020

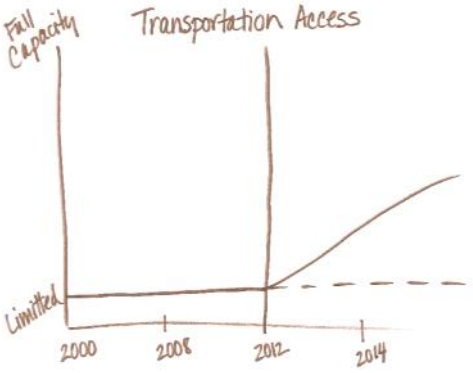

Coordination
Between Partners from
Different Fields
H
H
F
L
2008
2012

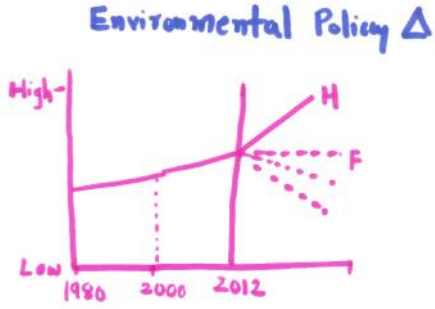

SCHOOL GARDENS - PARENT + COMUNITY PARTICIPATION
+
-
2008
2012
2016

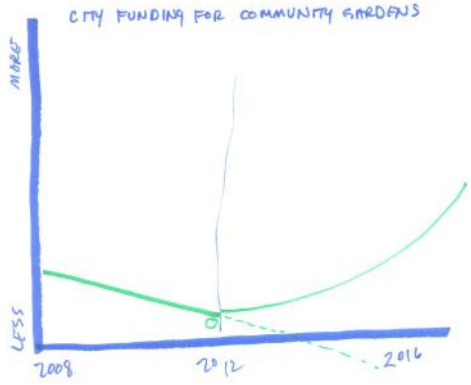

Time Spent Eating @ Home
Has few week Lots
Few
1950
1980
2000
2012
2020


INTEGRATION OF COMMUNITY INTERVENTIONAL STRATEGIES
HIGH
LOW
1990
2000
2012
2020


Resources for Community Engagement
$$$
$
2008
2010
2012
2014


Transportation Access
Full Capacity
Limited
2000
2008
2012
2014


Environmental Policy Δ
High
Low
H
F
1980
2000
2012


CITY FUNDING FOR COMMUNITY GARDENS
MORE
LESS
2008
2012
2016